



N A T I O N A L
E S T U A R I N E
R E S E A R C H
R E S E R V E
S Y S T E M

2009

Education Program

NEWSLETTER

Table of Contents

National Estuarine Research Reserve System

Education Program

Newsletter – October 2009

TABLE OF CONTENTS.....	1-2
ACE BASIN NERR, SOUTH CAROLINA.....	3
APALACHICOLA NERR, FLORIDA.....	Not available at time of publication
CHESAPEAKE BAY NERR, MARYLAND.....	4
CHESAPEAKE BAY NERR, VIRGINIA.....	5
DELAWARE NERR, DELAWARE.....	6
ELKHORN SLOUGH NERR, CALIFORNIA.....	Not available at time of publication
GRAND BAY NERR, MISSISSIPPI.....	7
GREAT BAY NERR, NEW HAMPSHIRE.....	Not available at time of publication
GUANA TOLOMATO MATANZAS NERR, FLORIDA.....	8
HUDSON RIVER NERR, NEW YORK.....	9
JACQUES COUSTEAU NERR, NEW JERSEY	10
JOBOS BAY NERR, PUERTO RICO.....	11
KACHEMAK BAY NERR, ALASKA	12
MISSION-ARANSAS NERR, TEXAS.....	13
NARRAGANSETT BAY NERR, RHODE ISLAND	14
NORTH CAROLINA NERR, NORTH CAROLINA.....	15

NORTH INLET-WINYAH BAY NERR, SOUTH CAROLINA	16
OLD WOMAN CREEK NERR, OHIO	17
PADILLA BAY NERR, WASHINGTON	18
ROOKERY BAY NERR, FLORIDA.....	19
SAN FRANCISCO BAY NERR, CALIFORNIA	20
SAPELO ISLAND NERR, GEORGIA	21
SOUTH SLOUGH NERR, OREGON	22
TIJUANA RIVER NERR, CALIFORNIA	23
WAQUOIT BAY NERR, MASSACHUSETTS	24
WEEKS BAY NERR, ALABAMA	25
WELLS NERR, MAINE	26
ESTUARINE RESERVES DIVISION	27-28

ACE Basin NERR, South Carolina

Louie Heyward, Education Coordinator - heywardl@dnr.sc.gov

Highlights

- Again this summer, we held three successful workshops: two on barrier islands, and one ACE Basin Teacher Workshop, which involved twelve elementary, middle and high school teachers who stayed at our field station for four days learning everything possible about the ACE Basin and the estuary.
- Renovations to the exhibits at the Edisto Interpretive Center were completed, and the highlight of our year at the Interpretive Center was the completion of our barracks. This dormitory, which will be used to house visiting scientists, interns, and the likes, is an impressive green building with a sleeping capacity of 15 -18 persons.
- Our volunteer staff at Botany Bay Plantation is ever-growing, and now numbers over 100. Two appreciation events were recently held for the “Botany Bay Buddy” volunteers. These included a cook-out featuring a Lowcountry shrimp boil, and a cruise aboard the *EV Discovery*.
- In response to the Last Child Left in the Woods book, the ACE Basin Education team, along with the entire South Carolina Department of Natural Resources has launched a state-wide initiative aimed at getting more students from in front of the televisions and computers and back outside. This is a tremendous undertaking, but one that so far, has proven to be very rewarding.
- A final highlight of the year at the South Carolina Department of Natural Resources involved the merging of the ACE Basin NERR staff and the Department’s Office of Public Affairs. Now as the Education Coordinator for the entire Marine Division, (and not just the ACE Basin) it allows us to spread the estuary “conservation and stewardship message” to a wider audience.

Outcome Summary

Once again, the ACE Basin Reserve has had a tremendous year! Activities in the basin included the hosting of over 6,000 students and adult groups. These events encompassed classroom visitations, field trips, educational cruises aboard the Educational Vessel *Discovery*, and on-site activities at the Michael D. McKenzie Field Station the Edisto Interpretive Center, and Botany Bay Plantation. Both K-12 and adult groups alike, continue to benefit from the many experiences and opportunities afforded to them by the ACE Basin Education team!

Chesapeake Bay National Estuarine Research Reserve in Maryland

Bart Merrick, Education Coordinator- bmerrick@dnr.state.md.us

Program Highlights

- **K-16 Formal Education Programs** In addition to numerous field-based programs at the Maryland Reserve components, CBNERR-MD has continued to work with its State partners to bring Somerset County students Wetlands and Wildlife Field Day. This program introduces all of the 4th graders in Somerset County, MD to the unique and abundant natural resources in their own backyards and provides links to how students and county residents can both enjoy and have a positive impact those resources.

- **Maryland Green Schools Program** CBNERR-MD helped to support the Maryland Green Schools Awards Program. The Maryland Green School Awards Program is a holistic, integrated approach to authentic learning that incorporates local environmental issue investigation and professional development with environmental best management practices and community stewardship. The program culminates in the schools and centers being certified as Green Schools.

<http://www.maeoe.org/greenschools/overview/index.php>

Special Events

NOAA Restoration Day: This year CBNERR-MD had the opportunity to work with our partner organizations and host NOAA's Restoration Day Event. During this event NOAA Staff planted trees and submerged aquatic vegetation, removed invasive species, and really got into the resources that NOAA's NERRS strives to protect and understand.

Earth Day: NOAA Administrator, Dr. Jane Lubchenco joined CBNERR-MD in a celebration of the NERRS and the important role they play in understanding and teaching others about coastal systems.

FLAGSHIP PROGRAM

Data and the Estuary - Teacher Professional Development Workshop

CBNERR-MD, in partnership with NOAA's Chesapeake Bay Office, conducts a multi-day professional development course for Maryland teachers focused on the incorporation of estuaries into the classroom. The workshop utilizes the Estuaries 101 curriculum, online resources for authentic estuarine data, and hand-on field based investigations alongside the CBNERR Research Coordinator to build teacher confidence in estuary related science and issues.

Outcome Summary The Chesapeake Bay region has many opportunities for teachers, students and the public to learn about the Chesapeake Bay and its issues through both field experiences and professional development workshops. CBNERR-MD is well positioned to support these experiences through targeted issue-based investigations and programming and fill in the gaps, especially in regards to data-driven estuarine investigations. Additionally, CBNERR-MD has worked hard to develop partnerships with other organizations involved in Environmental Education to more effectively utilize limited resources and provide linkages between programs.

Chesapeake Bay NERR – Virginia

2009 Education Program Report

Sarah McGuire, Education Coordinator – mcguire@vims.edu

Flagship Program

• Middle School Marine Science Project

The project “Chesapeake Studies: Linking Field Trips with the Classroom” is currently underway for its fifth year. The objective is to provide every 7th grade student in Gloucester and Mathews County with a meaningful field experience that is integrated into the classroom. Oyster restoration, summer flounder growth studies, and blue crab habitat studies were the major pathways. This project has already reached 2,550 students over the first four years.

Program Highlights

• Summer Programs

CBNERRVA created and implemented a new series of week-long summer programs in 2009 entitled Wetland Waders, Bay Savers, Bay Tech, Chesapeake Bay Investigators, Chesapeake Bay Explorers. Each of the camps focused on a theme and a specific age group of students between 1st and 8th grade. The Explorers camp spent the week at the VIMS Eastern Shore Lab in Wachapreague where they were exposed to the bay and ocean sides, mud flats, creeks, islands, etc.

• Public Education

CBNERR-VA participated in several public outreach events including Marine Science Day, Estuaries Day, and Dragon Run Day. These public outreach events increase CBNERRVA’s visibility to the community while promoting an understanding and appreciation for estuaries.

• Discovery Lab

The Discovery Lab series is a family friendly open house lab with activities for all ages, current research, and a short speaker, all focusing on a marine science topic. Topics for the 09 season included: Estuaries, Shorebirds, Mollusks, Climate Change, Why Animals Don’t Wear Clothes, Chesapeake Bay Revealed, Sponge Bob, and the Mad Lab: Lurking in the Shadows.

Outcomes Summary

The Chesapeake Bay NERRS education program focuses on teacher trainings, extended student programs during the summer, a classroom and field project with middle school students, and hands-on public education. While a majority of our focus is on our middle school project, we have expanded to elementary school groups by adopting a local elementary school to provide field trips throughout the year. We also are putting forth effort to increase NERRS visibility within the community with more public outreach, especially with our Discovery Labs and Estuaries Day event.

Delaware NERR – Delaware

Jennifer Holmes, Education Coordinator – Jennifer.Holmes@state.de.us

Formal Education/K-16 Education

• School outreach and field trips

Classroom outreach presentations logged approximately 618 contact hours for groups ranging from pre-school to graduate school. DNERR component hosted many school field trips ranging from preschool to graduate school with approximately 2,918 contact hours were logged. DNERR educators continue to serve on the planning committee for Delaware's Canon ENVIROTHON.

• Make a Splash Water Festival and National Estuaries Day Celebration

The Make a Splash water festival was conducted on September 29, 2009 for approximately 430 Delaware 4th graders. These students participated in hands-on, interdisciplinary activities about the St. Jones River Sub-Estuary. This festival was conducted in conjunction with the John Dickinson Plantation and Tidewater Utilities.

Public and Community Education

In addition to the following, local partnerships allowed the Reserve to reach over 10,000 community persons through events such as Coast Day, the Delaware State Fair, Wilmington Earth Day, the Milton Horseshoe Crab Festival, and Delaware Bay Days.

• Community education/public programming

Public programming attendance increased this year (30 programs, 378 total participants). Six of these programs were offered at our Blackbird Creek Reserve component. This year the DNERR partnered with the Division of Fish and Wildlife and Watershed Assessment to provide a Geocache Adventure throughout Kent County to celebrate American Wetlands Month.

• Blackbird Creek Fall Festival

The DNERR hosted the second annual Blackbird Creek Fall Festival on October 25, 2008. Approximately 200 people attended the event. Activities included canoe trips, hikes, hayrides, local artisans, exhibitors, live music, and food.

Professional Teacher Development

• Green Eggs & Sand: The Horseshoe Crab/Shorebird Education Project

In May 2009 training workshop was held in Delaware with a total of 27 participants from 5 states. In addition, the GE&S Curriculum is being revised and updated. A curriculum writing workshop was held August 3-5 2009 in which 22 teachers and resource experts participated.

• Project WET (water education for teachers)

Workshops were held for formal educators in October 2008 and pre-service education instructors in March 2009.

Outcome Summary

The DNERR continues to work with numerous partners to provide quality educational experiences. This year the DNERR has conducted more community outreach with the assistance of our volunteers and partners which has increased awareness of the Delaware Bay estuary and its sub-estuary systems. We have also seen an increase in volunteers as outreach has increased. In the upcoming year, the DNERR will undergo strategic planning to define our niche within the K-12 community and the public need for meaningful outdoor experiences.

Grand Bay National Estuarine Research Reserve

Jennifer Buchanan, Education Coordinator -

jen.buchanan@dmr.ms.gov

Program Highlights:

- The **Greatest Highlight** of the EC program is the completion of our new Grand Bay Coastal Resources Center. For the first time in ten years we are not housed in trailers! The energy and environmentally friendly building (LEED) features classrooms, labs, an interpretive center, offices and a dorm.
- Our **Annual Flagship Education Program** is the award-winning *Celebrate the Gulf Marine Education Festival*. Although this family-oriented festival takes place offsite, it is designed to highlight all the wonderful resources found in and adjacent to the Gulf including estuaries. Over a thousand people attended this one-day, hands-on event.
- **RC and EC collaboration:** the most important collaboration resulted in the completion of our newest field guide, *Selected Birds of Grand Bay National Estuarine Research Reserve and Vicinity*. Our RC and his assistant, Jake, both premiere ornithologists, were instrumental in helping me produce the book.
 - The research staff also has collaborated on several community and K12 programs including a Blacklighting for Bugs twilight event and a few K12 boat excursions.
 - The RC and SC also assisted me in editing a new poster entitled, *Selected Plants of Mississippi's Wet Pine Flatwoods*, that was just completed and serves as a companion to the plant guide we released last year.
- **Other Notable Education Activities**
 - A Pre-K12 Program Coordinator is contracted through the University of Southern Mississippi's J.L. Scott Marine Education Center (MEC). This educator promotes the use of the reserve as an experiential site for the school groups that attend the MEC's spring Mini-Camps and summer Sea Camp Sessions and our school On-The-Road Program.
 - We partnered on a successful Underrepresented and Underserved Population Grant with the MEC, the Gulf Islands National Seashore and the Moss Point School District in order to enhance the retention of science content of fourth graders with experiential education.
 - Several *My Coast* Community Workshops have been held during this grant period, in partnership with the MEC and the Environmental Studies Center of Mobile County, Alabama including: *Selected Plants of Coastal Mississippi and Alabama*; *Alien Wildlife of Florida*; *Firewise Landscaping*; and a *Botanical Walkabout*.
 - We supported three events in honor of National Estuaries Day this year: the bug event mentioned earlier, the annual meeting of the Mississippi Native Plant Society and a booth at Wavefest on the other side of the state.
- **Outcome Summary:** Community outreach programs and the development of educational products have been prioritized during this last year. Over 7500 high quality field guides and posters have been distributed. Because the bird guide incorporated photos from many local birders and nature photographers, there has been a lot of community interest in the project. In the first half of 2009 alone, 3300+ students have been reached through 32 K-12 programs.



Guana Tolomato Matanzas National Estuarine Research Reserve

Angie Golubovich, Education Coordinator – Angie.Golubovich@dep.state.fl.us

Program Highlights: K-16 Education Programs: (3,832 students, 370 chaperones/teachers) Estuary Explorers (4th), Eco-Investigator Program (K-3rd, 5-8th), Learning in Florida's Environment (7th), Watershed Studies Program (*High School & College*, Teacher Workshop Series (*Public, Private, & Home-school Instructors*)

Public Programs: (3,832 program attendees, 8,573 Center Visitors)

Brown Bag Lunch Lecture Series (*1st Friday of each month*), Nature Walks & Bike Tours (*2nd & 4th Saturday of each month*), Family Fun Hour for Toddlers and Parents (*3rd Wednesday of each month*), Snakes 101/Leave No Trace Family Workshop and others are offered.

On-site & Off-site Community Outreach Events: (18 programs, Typical Audience 100-5,000) *International Coastal Cleanup*-130 people picked up 597 pounds of trash and data was sent to The Ocean Conservancy. *(National Estuaries Day canceled-- building repair schedule) Examples of off-site outreach programs: Deaf/Blind Earth Expose & Water Education Festival.

Flagship Program: GTMNERR and Sea Grant partner to offer an intensive adult program called *Exploring our Environment*. This program involves 40 hours of instruction with lectures, field and classroom activities that detail the natural history and environmental issues of Northeast Florida. 66 residents participated in the program from October 2005 through March 2009. Of 24 class participants who responded to a survey in December 2008, 22 (92%) indicated that they had made at least one behavior change to benefit the coastal environment as a result of attending the class. These behaviors ranged from changing water use practices to changing the type of light bulbs used, removing invasive plants from landscapes to not disturbing shorebirds while walking on the beach. 22 people have shared class information they learned with others; 13 of the respondents shared information with more than 10 people. 11 of the respondents have become volunteers as a result of the class! Another exciting new initiative is our *Think Ecologically! Sustainable Living Series Program* which seeks to build upon the same behavior change results of the Exploring our Environment program. Modules include Water Conservation & Water Quality, Native Landscaping, and many more. This program is designed to target residents in neighborhoods adjacent to Reserve property in the hope their daily living habits will become more sustainable, thus protecting the GTMNERR estuary.

RC-EC-SC Coordination: The RC, SC, & EC among others coordinated to successfully host the 2009 SC-RC conference. The Research, Ecosystem Science, and Stewardship teams have been *instrumental* in allowing the education team to translate science to the public via teacher workshop programs and **informational products** such as **newspaper articles and website postings** with topics such as water quality, habitat restoration, invasive species, secretive marsh bird surveying, and many more. GRF's have offered lectures to the public about their projects.

Outcome Summary By initiating new Teacher/Volunteer training workshops the GTMNERR has been successful in transitioning K-6 programs to a volunteer/teacher led format to allow K-16 instructors to focus on program evaluation and developing new programs such as a future *Science Isn't That Scary* workshop for teachers, adults, and volunteers. A couple of exciting 2010 projects include 10 Year Anniversary events and a DVD project aimed to educate residents adjacent to the Reserve about beach/dune habitat etiquette. Programs are correlated to the objectives and strategies of the Reserve's new management plan.

Hudson River NERR

Jean McAvoy, Education Coordinator- jvmcavoy@gw.dec.state.ny.us

In winter 2009-09 we experimented with distance learning via videoconferencing. Although our connection speed is JUST adequate, we made a number of virtual visits into Hudson Valley classrooms and feel it was a good beginning.

The education program is now in full swing at Norrie Point, in spite of losing one of our usual interns to the economic crisis. Spring 2009 was especially busy. We hosted EstuaryLive for the first time, in honor of the 2009 Quadricentennial of Henry Hudson's first major exploration of the river. The Juvenile Eel Survey also took place, with high school and college students monitoring 5 tributaries of the Hudson for the arrival by glass eels, along with a full schedule of middle school through post-secondary school field trips.

Summer 2009 brought the usual schedule of guided canoe trips for the general public, community groups and graduate students, plus a larger than usual commitment to local community festivals and events prompted by the year-long Quadricentennial focus in the valley. We worked around record-breaking wet weather surprisingly well.

Autumn 2009 brought a resumption of school field trips, with more teachers responding to our efforts to spread out spring demand. We also participated in the annual Day in the Life of the Hudson River, which is sponsored by our close partner the DEC Hudson River Estuary Program along with Lamont Doherty Earth Observatory. This event coordinated observations taken by 3000 school children at 63 sites along the Hudson on a single day. National Estuaries Day was celebrated with Science on the River, our annual open house which showcases current Hudson River research by the reserve and other regional institutions. We were particularly pleased to include high school students from Harlem among our presenters and to attract attendance from some local college classes as well as the general public.

Year-round events like the monthly lecture series, Tivoli Bays Talks (in its 6th year) and Wild Wednesdays (a collaboration between SCA intern and the Tivoli Free Library, now in its 3rd year) continued as well.

Once school visits taper off in November, so we have some teacher meetings lined up to discuss more distance learning opportunities and how to incorporate Hudson River Estuary education into the school curriculum (at a level we have the staff to support!)

Other cold weather projects include web development and interpretive design.

Jacques Cousteau National Estuarine Research Reserve

Melanie Reding, Education Coordinator- reding@marine.rutgers.edu

Program Highlights

Professional Development Training

A new series of professional development habitat workshops were kicked off for formal and non formal educators, covering wetlands, shallow bays and the open ocean. Each workshop included hands on activities, field trips and presentations by scientists and researchers working within the Reserve. The objectives of the workshops were: to increase educator confidence with habitat-based science content, introduce inquiry-based activities and practice a variety of teaching strategies, and for participants to receive high quality resource materials to facilitate their science teaching.

K-12 Programs

The JC NERR partnered with one of our MARE program schools and two marine technology high schools for a seamless network partnership project with NOAA, NPS, and NJ Sea Grant demonstrating benthic habitat mapping and marine technologies. Students watched the deployment of our autonomous underwater vehicle REMUS, participated in a side scan sonar presentation and then designed, built and launched their own working remotely operated vehicles. The JC NERR hosted our 9th annual Shore Bowl, the NJ/PA regional competition of the National Ocean Science Bowl with 11 schools participating in this year's competition.

Recreation and Public Programs

Our recreation programs this year focused on connecting the upper and lower parts of the watershed, stressing that what happens inland effects the coastal waters. These recreation programs included canoeing, bus tours, and hikes that helped to raise awareness of the entire watershed. JC NERR held its first annual celebration of International Migratory Bird Day and partnered with CTP to offer a series of successful Rain Garden workshops which will be further enhanced next year.

Lunch n' Learn Series

2009 brought a record breaking year of attendance for our Lunch n' Learn series. In partnership with the Tuckerton Seaport, the JC NERR continues to provide a very successful monthly speaker series focused on the research, cultural history and "critters" of the Great Bay and Barnegat Bay estuary systems. Participants learn from the speakers, who are experts in their respective fields, of what is happening "in their own backyard".

Outcomes Summary: The Jacques Cousteau NERR education program continues to focus on teacher training and public education. Working with the RC we are in the process of creating a series of brochures to explain the various research projects happening in and around the Reserve. Our newly designed website will be going live this winter with an interactive Reserve habitat map and an expanded education resource section.

Jobos Bay NERR

Sandra Lebrón-Education Coordinator (EC) slebron@jbnerr.org

Nilda Peña-Environmental Educator (EE) npena@jbnerr.org

Special education activities:

The EC and EE participated in **Environmental Fairs** with the new traveling exhibit.

The EC offered a **virtual mangrove conference** to high school students from Tamaulipas, Mexico for the *Science & Spanish Club* in coordination with the Gulf of Mexico Foundation.

The **Research Coordinator (RC)**, Angel Dieppa and EC offered an interview for the TV Program “Aventura Científica” (SíTV-University Ana G. Méndez) and a guided snorkeling field trip to the coral reef ecosystem for high school students working in an Environmental Science Fair project about climate change and coral reefs.

Ongoing creation of educational materials: The EC and the former **SWMP technician**, Nilsa Marrero, created an educational activity integrating JBNERR SWMP data and a Spanish translation of the *Estuaries 101* “Survival in an Estuary”.

Summer activities: 5th Summer Camp “Guardians of the Estuary”: during 5 days local 5th and 6th grade students learned about estuaries, marine ecosystems, endangered animals, global warming, and recycling through conferences, hands-on activities and field trips.

JBNERR host a *summer research internship* for high school students, coordinated by the RC and the Forest Service. Also we host the residential summer camp for local community kids, coordinated by the community group “Diálogo Ambiental”.

Special activities for community groups and environmental organizations: Important outreach activities included the open house (“Parrandón Verde”, Christmas celebration~165 participants) and the International Coastal Cleanup (~150 participants).

Workshops for community groups working as Eco-tour guides were offered in collaboration with Sea Grant Education Coordinator-UPR Humacao.

Teacher’s Workshops in Jobos Bay Reserve: “Jobos Bay: a special Estuary”- 3 days residential workshop in coordination with the **Sea Grant EC**. “Mangroves: What we learn from sediments”- 5 days workshop in coordination with the **GRF**, Michael Martinez Colón. *Teacher workshops* (3) were coordinated with teacher training programs from University of Puerto Rico, Turabo University and Interamerican University.

Outcome Summary: Many on-site and off-site lectures about Jobos Bay Estuary, marine ecosystems & invertebrates, endangered species, and global warming were offered. Field trips to the Jagüeyes Forest, Cayo Caribe and the old Aguirre Sugar Mill trails. **In collaboration with RC**, the education staff provided technical support for projects, science fairs and/or special assignments to 9-12 students, undergraduate and/or graduate students. The majority of JBNERR visitors were scheduled school groups. The Visitor’s Center received **3,369** visitors from October 2008 to September 2009. The visitors include 1275 K-12 students, 63 teachers, 110 graduate and undergraduate students, 1556 local tourists, and 129 foreigner tourists. A total of 236 people used the library; visit the exhibits and/or JBNERR self-guided trails.

Kachemak Bay Research Reserve

Jessica Ryan, Education Coordinator- Jessica.ryan@alaska.gov

Kachemak Bay Research Reserve (KBRR) education staff is working with a videographer to create one 12-minute film on tides and the rich biology of Kachemak Bay, and 3 – 5 shorter clips on related topics. These films will be part of a larger exhibit that will include information on the dramatic tidal range in Kachemak Bay; the importance of plankton to the marine food chain; and several ongoing research projects in the bay. The space is being designed to appeal to young children as well as to an adult audience.

The 2008/2009 school year was full of activity with education staff providing marine science lab activities and field programs to numerous local and regional classes with students in grades K - 10. Programs included Marine Invertebrates, Microscope Lab, and Green Crab Monitoring to name just a few. Additional programs were presented at a Summer Activity Fair; to Holland America ship passengers; during the annual Shore Bird Festival; and to a Chamber Mixer held at the Lab entitled Discover Our Estuary.

KBRR's 2009 summer Discovery Labs were quite successful, with three labs presented weekly over eight weeks with a different topic each week. Topics included *Geocaching and Satellites for Science*; *Plankton: High Seas Drifters*; *Marine Invertebrates*; *Crustaceans: Crabs and More*; *Harvesting in Kachemak Bay*; *Fire and Ice: Volcanoes & Glaciers*; *Fish and Fishing in Kachemak Bay*; and *Subtidal Habitats: Life below the Surface*. Labs drew, on average, 100 people per day and appealed to locals and visitors of all ages. KBRR was fortunate to partner with staff from the Alaska Department of Fish and Game, the National Park Service, the United States Fish and Wildlife Service, the National Ocean and Atmospheric Administration, and the Pratt Museum in planning for, developing and presenting these labs. In addition, a number of dedicated volunteers made time in their busy summer schedules to assist with lab set up and delivery.

Education staff furthered our fledgling *Kids in Nature* program with workshops in Homer, Anchorage, and Seward for parents and caregivers with young children who are seeking to encourage a connection with the natural world. *Kids in Nature* is Homer's response to a national movement to engage children in unstructured and creative outdoor activities entitled *No Child Left Inside*.

Mission Aransas NERR

Rick Tinnin, Education Coordinator – rick.tinnin@mail.utexas.edu

New Bay Education Center

A partnership between the Aransas County Navigation District, the City of Rockport and Mission Aransas has led to the creation of the Bay Education Center. This 4,500 sq. ft. multipurpose building will house a visitor center with exhibits focused on bays & estuaries of the Mission-Aransas NERR; a meeting room/auditorium for CTP use and to host simulcast lecture series; offices for staff and a shaded outdoor patio education space. The Bay Education Center will be located on the shore of Aransas Bay and it will provide immediate access to rock jetty, bay shoreline and salt marsh habitats.



Visiting Class Program

213 RV KATY trips hosted 184 visiting class groups, 4,851 students

14 visitor center elementary touch labs/WEC tours for 975 students

Aransas County CIAP funds are supporting field trips for 5 Rockport schools, grades K-12 including boat trips and WEC activities for 1,420 students

Wetlands Education Center (WEC) Teacher Professional Development

Wetlands Education Center Curriculum Activities workshop, May 1-3, 30 teachers; WEC Life Science curriculum workshop Dec 4-6

WEC Tours

40 WEC activity student groups, 1,820 students

WEC trail counter averaging 250-300+/week for 39 weeks = 9,750 people

Community/Public Outreach Programs

3 Birding for Kids summer programs – 65 participants

Public Lecture Series which hosted 1722 attendees over 10 weeks

Volunteer cleanup of Aransas National Wildlife Refuge for **National Estuaries Day**

Outcomes Summary The Mission-Aransas NERR education program focuses on field based, hands-on science education for students and the general public. The floating classroom program combined with the Wetlands Education Center provides on the water and in the marsh experiences for K-12 students and informal outreach programs. The addition of the new Bay Education Center, scheduled to open in April 2010, will provide a presence for Mission-Aransas NERR in the middle of our 185,000 + acre Reserve and offer new formal and informal outreach education programs to a new audience.

Narragansett Bay National Estuarine Research Reserve

Kristin Van Wagner, Education Coordinator – Kristin@nbnerr.org

Public Outreach and Communications

- Design and development of the 2010 Rhode Island Tide Calendar (5,000 copies to be distributed in MA & RI). Held statewide photo contest for the calendar's cover shot.
- Published two Reserve newsletters including articles about research, monitoring and restoration science in Narragansett Bay.
- Sent out eAlerts to the Reserve's email list of over 1600 people with program updates.
- Worked with the media to publish article in printed and on-line publications.
- Posted a new Technical Report Series on our website.

Education Programs

- Ran year-round, family oriented and educational 6-hour tours of the Reserve.
- Summer campers, home school students, at risk youth, private school students, and accompanying teachers and chaperones attended educational programs on Prudence Island (limited island access largely excludes traditional K-12 school visits).
- Gave presentations in RI schools upon request
- Participated in school science events, gave presentations at RI Community College and to local stakeholder groups, and exhibited at several public events.
- Education partner, Save the Bay, brought approximately 1000 K-12 students and campers to the Reserve by boat on school field experiences and summer camps.

Teacher Training

- Collaborated with the Waquoit Bay and Wells Reserves to implement a 3-day "Teachers on the Estuary" workshop both at NBNERR and at Waquoit Bay NERR. This was the first of three TOTE workshops to be held at NBNERR.
- Ran day-long teacher trainings on Prudence Island for student teachers from Rhode Island College and for teachers from local schools.

Public Event Programs

- Held two annual Prudence Island beach cleanups; Earth Day and the ICC.
- Held two signature events; the summer Narragansett Bay Block Party and the Holiday Open House with our best attendance yet at the Bay Block Party (200+).
- Held two "North End Recreation Days" to provide access to the northern part of the Reserve
- Organized & hosted sponsors for the Prudence Island Sustainable Fishing Tournament.

Exhibit Development

- Completed an exhibit panel interpreting the cultural history of local Native Americans.
- Ran seasonal "Estuarium" exhibits with ID cards for estuary species in the tanks.
- Completed and installed a self-guided hike with an illustrated educational booklet and numbered stops along a loop trail in the southern portion of the Reserve.

Outcome Summary Our program expanded teacher training offerings, enhanced overnight marine science summer camps, improved education program offerings, increased the number of people reached through events, publications, & website and programs, and continued to raise awareness of our organization around the state.

North Carolina National Estuarine Research Reserve

Jill C. Fegley, Ph.D., Education Coordinator - jill.fegley@ncdenr.gov

Junior Naturalist Summer Camp (Flagship Program)

An 8-week Junior Naturalist program was held for students in grades 5-8. Field investigations on the Rachel Carson Reserve in Beaufort included: an estuarine ecology investigation; a fiddler crab population activity; a horse behavior study; a water quality study; a plankton collection and observation; a mud and marsh snail comparative study; a marsh profile and plant zonation survey; and a fish seining activity. Studies focused on the scientific method and taught students how to collect and analyze scientific data. This program was fully subscribed in only its second year. We anticipate expanding the program next year.

Market Analyses/Needs Assessment

A needs assessment survey was sent out to over 1,300 formal educators in North Carolina's 20 coastal counties. A market analysis was also conducted of agencies within North Carolina that provide estuarine or coastal education to identify gaps in the existing programs offered to NC teachers and students. The results of both surveys will be used to inform future programs and activities.

Public Education/Community Outreach

Community outreach programs were held for 34 different community organizations. A total of 727 individuals participated in these programs. Summer public field trips were also held bi-weekly throughout the summer at the Rachel Carson Reserve (182 participants). The Reserve also held three other summer camps for pre-K to 3rd grade students.

Teacher Professional Development

Sixty-two teachers participated in three professional development workshops this year. Two of the workshops were held specifically for pre-service teachers. The Reserve also provided training to 26 middle school teachers through the NC Environmental Education Summer Institute.

National Estuaries Day and National Public Lands Day

In celebration of National Estuaries Day and National Public Lands Day (September 26) the Reserve offered a variety of education and outreach events in partnership with the NC Maritime Museum in Beaufort. Activities included a coastal clean-up of the Beaufort waterfront followed by free nature hikes and boat tours around the Rachel Carson Reserve. Outdoor interactive education displays and an indoor showing of the "Waters of Life" film took place from 9 a.m. until 2 p.m. in front of the Maritime Museum.

Outcomes Summary

This year NCNERR focused on partnering with local school districts to more effectively utilize limited resources and to increase the Reserve's profile and local educational impact. Strong inter-sector collaboration led to the development of new site brochures, the EC's participation in SWMP data analysis, the EC as a guest lecturer in 2 CTP workshops, and collaboration with the RC on an estuarine shoreline stabilization grant. The EC is also working with the new GRF to develop teacher workshops.

North Inlet-Winyah Bay NERR – South Carolina

Beth Thomas, Education Coordinator - beth@belle.baruch.sc.edu

Discovery Center Expansion Completed!

The Hobcaw Barony Discovery Center (HBDC) was completed in July (with furniture arriving just in time for the building dedication on September 18th!), and is the new home of the NIWB NERR K-12 & public education program and the NERRS Centralized Data Management Office. The new center is a 13,500 sq. ft. joint-use facility of the Baruch Foundation, the NIWB NERR, and the University of South Carolina. The new facility includes 1800 sq. ft. of exhibit space, a reception & gift shop area, classroom, seminar room, and office space for education and CDMO staff. A new outdoor interpretive shelter and dock adjacent to the USC Kimbel conference center and pond have also been recently completed as part of this construction project.

K-12 & Public Outreach

K-12 programs are continuing to attract school students from both public and private schools, but field trips this past year have also included increased numbers of home schooled students, as well as on site field studies for the SC Virtual Charter School with students from all over the state. Public outreach in 2009 included the first ever “green” festival for Georgetown County, “George Goes Green”, and the NIWB NERR was represented at this community event. NIWB staff participated in the annual River/Beach Sweep, cleaning the Sampit River this September. The NIWB NERR hosted a National Estuaries Day Open House and over 250 people attended the festivities. Georgetown High School art and environmental science students painted rain barrels for a show and sale during the open house event and also presented information on stormwater, rain gardens, and rain harvesting.

Partnership with Waccamaw Regional Education Center and National Geographic ‘Jason’ Project for Georgetown County Schools

The NIWB NERR is working with the Georgetown County School District to offer for the second year field components to the two Jason Expedition series, ‘Resilient Planet’ and ‘Monster Storms’. These curriculum modules were developed to incorporate science careers and students spend part of their classroom time visiting research sites and speaking with scientists-NERR staff presented research and monitoring information to high school students from surrounding high schools in Georgetown and Horry Counties.

Coastal Waccamaw Stormwater Education Consortium (CWSEC) core education provider

The CWSEC is working with Georgetown High School on stormwater education, rain garden installation and water quality monitoring. With community improvement grant funding from Wal-Mart, local schools are installing rain gardens with native vegetation and purchasing monitoring equipment to analyze school runoff before and after infiltration through the rain garden.

Outcome Summary

Developing and maintaining collaborative partnerships has helped increase the impact and profile of our programs. In particular, the expanded Discovery Center offers higher visibility and space for more and larger group programs, and new expertise with shared staff and volunteers. A strong partnership with the CWSEC has also helped raise community awareness of water quality and quantity.

Old Woman Creek NERR – Ohio

Phoebe Van Zoest, Education Specialist - phoebe.vanzoest@oldwomancreek.org

PROGRAM HIGHLIGHTS

Estuary Explorations – 450 residents and visitors participated in this series of 30+ learning opportunities including topics such as nature sketching, wildflower/ tree identification, rain garden design/construction, rain barrels, litter clean-ups and nature inspired pottery. Canoe tours were among the most popular events, all eight at capacity.

Community Education - Provided 30 programs for civic groups, garden clubs and other community based organizations on topics from dragonflies to wetland ecology and rain gardens.

K-12 Education – 500 students participated in 21 programs on freshwater estuarine and coastal wetland ecology (800 contact hours).

Teacher Education - Worked with Atziri Ibanez, Chris Wilson and Rebecca Weidman to present three Estuary Live Webinars to 6 teachers across the U.S. Webinars are planned for 2010 at varied times to allow for increased participation.

Watershed Bio Blitz – A 24 hour program implemented in collaboration with Erie Metroparks. 637 species found, 71 of which were new additions to the Reserve's watershed species list. Several investigators participated and 30 volunteers donated over 300 hours to this event.

PARTNERSHIPS

Firelands Coastal Tributaries Watershed Program –Education Specialist chairs sub-committee which publishes a quarterly newsletter, develops communication products, and coordinates volunteer stream monitor training. Education staff assisted with writing of a Watershed Action Plan for Old Woman Creek that has achieved endorsement by the Ohio EPA.

Lake Erie Partnership and Lake Erie Literacy–Collaborating with the Ohio Coastal Management Program, Ohio Sea Grant College Program and the Ohio Lake Erie Commission to develop a strategic plan for Lake Erie education aligned to the NOAA Education Strategic Plan. These agencies identified a need for a place-based environmental literacy framework and are adapting *Ocean Literacy: the Essential Principles and Fundamental Concepts* to Lake Erie.

www.ohiodnr.com/LakeErieLiteracy

Meeting the Challenges of Great Lakes Stewardship: Science Education for New Civic Engagement and Responsibilities (SENCER) – Assisted with conference for undergraduate faculty to set Great Lakes agenda for STEM service learning. SENCER is a National Science Foundation-funded program that provides opportunities for faculty to improve science education by focusing on real world problems.

OUTCOME SUMMARY Surveys are distributed via postcards at the conclusion of each *Estuaries Exploration* program. Surveys gather feedback on content, format, increases in understanding, and intent to use new information or skills at home or work. Most of this year's participants reported a high likelihood of using information they learned in their daily lives.

Padilla Bay Reserve

Glen “Alex” Alexander, Education Coordinator, alex@padillabay.gov

Flagship Program

Our K-12 program was funded this year by a **B-WET Grant** from the NOAA Education Office. We offer field trips to classes in any grade but those in grades 4 and up are eligible for a five-hour program including Estuary Soup and a trip to the beach to collect organisms that are later viewed under microscopes. Any grade can get a 1.5 hour experience in the building without guidance at the beach or microscopes. This year we served about 7,000 people. About 15 to 20 percent of these are adults who volunteered to attend as helpers.

Teacher workshops

The B-WET Grant also funded two teacher workshops modeled after TOTE. One at Padilla Bay targeted grades K through 3 and one in Olympia (State Capital, about 130 miles south, at the south end of Puget Sound) was for grades 4 through 6. Each workshop was three days (three consecutive Wednesdays).

Curriculum Development

Teachers who attended the teacher workshops created lesson plans designed to meet state standards and Meaningful Watershed Education Experiences (MWEE). These lessons will soon join other lessons on our web site that were created at a previous workshop. Please go to: <http://padillabay.gov/lessons.asp>

Senior Culminating Projects

Our state now requires all high school graduates to complete a project outside of class time. Imagine an army of students working to improve the environmental health of Puget Sound. A grant from a new state agency (Puget Sound Partnership) helps us connect professionals with students who select a project that benefits the health of Puget Sound. Ask me about some of the projects that have been completed or are currently being planned.

Climate Change Education

- Climate Stewards is a new adult volunteer training program. Citizens receive 36 hours of training about climate change and community organizing in exchange for 36 hours of community organizing designed to reduce carbon emissions.
- Youth Earth Summit (YES) is a one-day gathering environmental clubs and classes from local high schools and community colleges.
- Susan Wood is a member of the Skagit County Climate and Sustainability Task Force, charged by the County Council to develop a strategy for reducing carbon emissions in Skagit County. She is also a member of the NERRS Climate Change Work Group
- Skagit Cool Community Campaign organizes teams of adults to collectively reduce residential carbon emissions.

Rookery Bay NERR

Susan Cone, Education Coordinator- susan.cone@dep.state.fl.us

Estuary Explorers Program: Teacher training and field trips for public school 4th graders. Educators Guide includes pre-visit and post-visit activities to enhance the visit to the Reserve. Field trip is hands-on and co-led by the classroom teacher.

Boat Based Field Trips: For high school and college marine science students, on the water boat trips usually include a trawl to explore the diversity of estuarine inhabitants.

LIFE Program: Florida Department of Environmental Education LIFE program includes 3 field experiences. Program is offered to 3 targeted middle schools.

Guided Kayak Trips: Bi-weekly educational paddles including paddling instruction and an appreciation for our unique estuarine environment.

Cultural History Walks: Walks are led by trained volunteers during the season to explore Calusa and early pioneer history.

Amazing Adventure Speaker Series: Friday nights monthly during the season. Guest speakers share their experiences and adventures from around the globe.

Florida Master Naturalist Program: We conduct these 6 day courses as a part of this adult education program administered through the University of Florida

Daily Coastal Connections Programs: Presentations given twice daily to visitors to our Environmental Learning Center. Topics include sea turtles, manatees, water-birds, estuaries, etc.

Art Gallery Exhibitions: Our art gallery combines art and science through a partnership with the United Arts Council. New exhibits are launched with a reception.

Special Tours/Field Trips/Summer Camps/Trainings/Outreach Programs: Many guided tours, topical programs and trainings are offered upon request for special groups, schools, clubs, summer camps, civic groups and libraries.

National Estuary Day Celebration: A free event featuring boat and kayak trips, touch tank, crafts, music, lab tours, food and fun.

Southwest Florida Nature Festival A collaborative effort with our partners to provide 3 days of field trips. Speakers and activities at our learning center.

Dive Into Oceans: A 3 day event including 2 days of middle school field trips. Event features the chance to SCUBA in a 20,000 gallon pool.

Girls Science Day: A day devoted to middle school girls.

Outcome Summary: All of our educational programs strive to deliver positive, rewarding experiences that increase the awareness and understanding of the value of coastal ecosystems.

San Francisco Bay National Estuarine Research Reserve

Sarah Ferner, Education Coordinator – daviess@sfsu.edu

Exhibit Grand Openings at 3 sites! (July 2009)

Beautiful new interactive interpretive exhibits were unveiled at both of our Reserve sites (China Camp State Park in Marin County and Rush Ranch in Solano County) and at a popular Aquarium in downtown San Francisco this July. Some highlights of the exhibits include an interactive fresh-salt water balance at China Camp, a floor to ceiling map of the estuary at the Aquarium of the Bay at PIER 39, and a hand painted mural depicting a cross section of the vibrant tidal marsh and slough at Rush Ranch. Each set of exhibits also includes changeable components that highlight current research projects happening within the Reserve. The exhibits were completed under the direction of the Education Coordinator with funding from a NOAA Construction grant and insightful input from educators and scientists at each of the three sites.

Rush Ranch's 'Ranch Day', China Camp's 'Heritage Day' and Romberg Tiburon Center's 'Discovery Day' (April, August, and October 2009)

Reserve staff educated visitors about wetlands during our annual open house events at Rush Ranch, China Camp, and at our administrative headquarters, San Francisco State University's marine research facility, the Romberg Tiburon Center. Visitors got up close with marsh plants and animals by examining a marsh terrarium. The Education Coordinator also led natural history walks and activities at Rush Ranch and China Camp's events.

Pre-service Teacher Training (Marsh 2009)

A small, but interesting program we offered for the second time this year was a field-based workshop for teachers-in-training from a local community college. The future early childhood educators learned hands-on activities and approaches to engage their students with science and nature by participating in their own guided exploration of the Reserve. This program was integrated into their college coursework and seemed to have a lot of impact without requiring as much staff time as a traditional teacher workshop. We hope to extend this model to other courses and colleges in the upcoming years.

Outcome Summary

This year we continued our focus on educating the public about the importance of wetlands and estuarine research through the development of interpretive exhibits, authoring articles about estuarine research for other organizations' newsletters, leading natural history walks, and participating in Open House events. With the completion of the multi-year exhibit project, we also began preparing to focus more on K-16 programming by building partnerships with researchers, experimenting with new teacher training formats and partnership opportunities, and grant writing to fund these new endeavors.

Sapelo Island NERR

Brooke Vallaster, Education Coordinator-brooke@darientel.net

Program Highlights

- **Teacher Training Workshops** – Marine Mammals, Georgia Shorebirds, The Ocean Floor Revealed (SECOSEE), Coastal Ecology, Sea Turtle & Diamondback Terrapin Conservation
- **Artist in Residence** – Christy Trowbridge spent a series of weekends on Sapelo Island this year creating paintings that feature the Reserve. The collection was featured at the Ritz Theater gallery in September and is scheduled to be shown on St. Simons Island in early '10.
- Per a 312 report recommendation, we developed a public relations/media outreach protocol and created a semi-annual **SINERR activity calendar** including research, monitoring, stewardship, education/training, and volunteer efforts. This calendar is used to develop larger SINERR themed stories for media outlets. Further, this proactive approach to outreach allows us to promote our programs in an on-going fashion.
- Created **media outreach** mechanism for teacher training workshop participants. The template allows teachers to promote their workshop experiences in their hometown newspapers/newsletters while featuring SINERR's education opportunities.
- Updated SINERR school program correlations to Georgia Performance Standards
- Created new **interpretive signage** for beach access points that features Sapelo's ecology and nearby Gray's Reef NMS.
- New SINERR and Friends of Sapelo **displays** for exhibit booths at area festivals and conferences.
- Provided assistance to Glynn County Schools via science fairs and planning for a marine science lab facility.
- SINERR representation on **advisory boards** of GAME, Georgia Conservancy Education Committee, Georgia Environmental Education Alliance, Georgia Environmental Education Alliance, and Thunderbolt Elementary School.
- **Special programs** included Crabbing & Shrimping on the Georgia Coast and clean up event for National Estuaries Day. SINERR also participated in Beach Days and CoastFest hosted by Georgia DNR Coastal Resources Division.
- **Collaboration with SINERR Stewardship, CTP, and Research coordinators.** The SC and RC have been speakers and have led activities at our teacher training programs. The SC and CTPC worked closely with our volunteer organization, providing GPS/GIS training for an area live oak inventory project and the marsh bird monitoring effort. SINERR manager also served as a featured speaker at volunteer and education programs.

South Slough NERR

Tom Gaskill, Education Program Coordinator-tom.gaskill@state.or.us

During the past year, education staff at South Slough has worked closely to integrate formal education and interpretive activities with public outreach and involvement. This work included student and teacher participation which supports the goals of the Reserve and expose a diverse audience to the research and stewardship activities in meaningful ways. Important accomplishments have been participation in the NERRS EstuaryLive 2009 broadcast, hosting of numerous programs and trainings for students and volunteers, facilitating a coastal education partnership to achieve a successful BWET funding proposal to support teacher training, and celebration of our 35th anniversary!

Formal Education and Training activities (Our Flagship Program) Over the past year, 55 formal education programs have been delivered for 1,863 students in grades k-18. The majority of these classes are k-12 students that participate in the Estuary Study Program with different levels of curriculum. Average program contact time is approximately 2 hours, although many classes are on-site at the Reserve for 4 hours or more. A total of 156 contact hours and 83 preparation hours were recorded. South Slough also hosted 2 segments of the NERRS EstuaryLive broadcast in May for 89 registered classes. Training opportunities for volunteers at South Slough continue to expand and 14 training events were conducted during the past year for volunteers and teachers. A total of 95 participants received training with a total of 35 hours of contact time and 22.5 hours of preparation time committed. A partnership between the South Slough NERR and the Oregon Coast Aquarium, Hatfield Marine Science Center, and the Oregon Institute of Marine Biology to develop a series of coastal education modules and provide teacher training in their use will significantly expand the Reserve's role in providing teacher professional development in Oregon. This project, funded by the NOAA/BWET program is a part of a long term strategy to integrate Reserve education efforts with other statewide partners and teacher training activities.

Interpretive and Outreach activities A diverse program of interpretive activities including guided paddle trips, hikes, hands-on workshops, and special events continues to be popular with children, adults, and families. 108 interpretive activities were attended by a total of 1,245 participants. 297.5 contact hours and 271 preparation hours were recorded. These events included 5 non-residential, week long summer science camps. The program themes for these activities and formal education programming are defined by our management plan and are consistent with other program areas of the Reserve and within the NERRS strategic plan. Topics included habitat restoration, invasive species, ecosystem health, and water quality.

Outreach events such as the Clamboree, the Charleston Seafood Festival, OctoberFish, and the Coos Bay Farmer's Market have become an important component for building community awareness of South Slough NERR. 20 outreach events provided contact with 2,281 individuals. A total of 88.35 hours of contact time was supported with 34.5 hours of preparation. Community Education has grown as an element of overall outreach activities of the Reserve with 19 programs conducted for 299 total participants. 44 contact hours and 25 prep hours were recorded for these events.

Outcome Summary A total of 216 education activities were delivered to 5,783 participants. Contact times varied from 20 minute informal interactions to 8 hour long classes with a total of 621 contact hours recorded. New and continuing partnerships are strengthening the Reserves capacity to access new audiences of teachers and students with programs, curriculum, and science-based content.

Tijuana River NERR

Anne Marie Tipton, Education Coordinator, amtipton@parks.ca.gov

Community Events and Programs

The subtheme of our **6th Annual Fiesta del Río event** (Oct. 4th) was “Go Make a Difference.” We hosted an exhibitors’ luncheon prior to the event to ensure that presenters would help meet our behavioral objective. The focus was activities that could be effective in provoking visitors to become citizen activists and stewards of our natural and cultural resources. They came up with great ideas, the audience favorite was a homemade Clean-up your Watershed Operation Game. A longitudinal study will allow us to determine the effectiveness of the event on attendees.

The **2009 Migratory Bird Day** (May 9th) theme was *Birds in Culture*. We worked with the ECs at each of the West Coast NERRS to highlight a significant bird from each of these stops along the Pacific Flyway. Kumeyaay wildcat singer Stan Rodriquez was solicited to represent the TRNERR who enraptured the whole crowd with his bird creation stories and wildcat songs.

The Reserve participated in the first **San Diego Science Festival**. Our Jr. Ranger programs and our Tijuana Estuary Explorers Training were included in the festival. We also hosted the **Marsh Madness open house** where guests participated in field activity stations and saw live animals in the lab (**it was a combined research and education effort**). The month-long festival ended with a Science Expo which had 50,000 attendees.

The monthly **Saturday Speaker Series**, provides continuing education for our volunteers and the general public. Speakers cover topics in cultural and natural history and current research conducted within the reserve. Kearney and Mar Vista high school students, who had worked with our RC, Dr. Jeff Crooks, gave talks about the project-based learning they did here at the Reserve.

Weekly **Junior Rangers** program continued for children 7-12 (average 9 children/week).

2008 Regularly Scheduled K-12/College Education Programs We conducted 21 elementary, 9 high school, and 2 college level on-site programs, as well as field trips for several youth education groups (including students from the San Pasqual Band of Kumeyaays) and outreach programs (such as Ocean Day at Silver Strand Elementary and Emory Afterschool Program).

Teacher Trainings We continued our **Estuary Ambassador trainings** with the South Bay School District (4 trainings for 2008-09). Education staff worked with teachers to develop ideas for new programs or tweak existing programs and to develop ideas for primary grade field trips so all covered the state education standards that the students are tested on. One of our partners, ProPeninsula, presented the Ocean Connectors program to the teachers. We hope to establish a formal partnership with the Coronado school district and expand the training to include them as well. Dr. Jeff Crooks is regularly involved in these trainings.

In August, nine teachers from middle and high schools along with three docents attended our annual **High School Teacher Training** which resulted in teachers booking field trips. The RC and Reserve research associates assisted in this effort.

Outcome Summary: An amazing variety of programs were offered to educate community audiences about the importance of the Tijuana River NERR.

Waquoit Bay NERR – Massachusetts – 2009 Program Report

Joan Muller, Education Coordinator, joan.muller@state.ma.us

Green Team: An intern collected baseline energy use data using an Energy Tracker spreadsheet. Staff attended training on building envelope and insulation concepts followed by hands-on weatherization of Reserve buildings and made recommendations for each building. Community Workshops were offered on energy efficiency, renewable energy, organic vegetable gardening and the Buy Fresh, Buy Local program. We hosted a weatherization workshop to train people for the Community Energy Corps weatherization program (a local project meant to lower fuel use and expenses for low income residents). The Reserve was awarded a Leading by Example grant to complete recommended energy measures. An organic demonstration garden with interpretive signs was started in the spring.

Social Science research: Graduate Research Fellow, Lisa Greber, continued her study on Religion and Climate Change in the Waquoit Bay Watershed. She completed interviews of religious leaders and is working to complete focus groups and surveys for lay people. She coordinated a workshop on energy efficiency in religious buildings that attracted 7 congregations.

Community Education: Underserved audiences/ ESOL: The Reserve partnered with the Cape Cod Immigrant Center and Cape Cod Community College's ESOL program to coordinate a grant funded Environmental Leadership Course for leaders of the Cape's immigrant communities. Families were targeted with hands-on school vacation programs. The retired population was targeted with the Live and Learn Series; weekly programs with a resource management/natural science bent, held weekly featuring an indoor lecture followed by an outdoor portion.

Teacher Training: Reserve educators worked with NBNERR and Wells to hold 3 day TOTE (Teachers on the Estuary) programs in RI and MA. Teacher Advisory groups helped plan the workshops. Additional graduate credit courses were offered in groundwater and watersheds, climate change (in collaboration with New England Aquarium), math and fisheries, and weather.

K-12: WBNERR partnered with WHOI and the Woods Hole Science Technology Educational Partnership to establish pilot protocols for estuary monitoring for the GLOBE program. Pat Harcourt is working with the state committee to revise the MA Curriculum Frameworks.

Collaboration with Research and Stewardship Departments: The research and stewardship departments conducted demonstrations and field work for the TOTE program. Stewardship and Research staff also participated in the statewide DCR coastal interpretive training. Classes for students included SWMP data. Education staff helped collect monitoring data.

Outcome Summary: Teachers trained, community members introduced to Reserve's research and coastal issues, some behaviors changed (see EC), greater awareness among immigrant communities and religious communities of Reserve's and other environmental organization's resources. All of this work was possible due to the hard work of the EC, Pat Harcourt, Nancy Church, & Laurie Tompkins.

Weeks Bay NERR, Alabama

Margaret Sedlecky, Education Coordinator- weeksbay@gulftel.com

K-12 School Programs

Approximately 3,500 K-12 students and chaperones visit the Reserve for hands-on fieldtrip programs. K-8 grade curriculum activities include topics such as estuaries, watersheds, ecological diversity and coastal food webs. 9-12 grade curriculum activities are conducted in the field and center around water quality and biodiversity themes.

K-12 Summer Programs

Summer programs for students are conducted by Education Specialist, Angela Underwood and Stewardship Coordinator, Eric Brunden. The *Art Without Limits* program is a partnership between the Reserve and the Eastern Shore Art Center. The *Coastal Discovery Day Camp* is a weeklong environmental camp held in conjunction with Coastal Wonders Program.

Professional Teacher Development Workshops 14 area teachers participated in a *Project Aquatic Wild and Project Wild* workshop hosted by the Reserve. 16 area teachers participated in a *Project Wet* workshop.

Outreach Programs

-Two one-hour *EstuaryLive* programs were broadcast on May 15th using direct-to-the-internet technology. Cost for equipment, T-1 line, and live-streaming server time was approximately \$30K (does not include labor or camera costs). A conservatively estimated that our programs reached 2,500 students and we received over 400 questions.

-1,000 students from six high schools participated in the *Baldwin County Grasses in Classes* Program. Students grow native vegetation on the school campuses. Twice during the school year students plant their plants in restoration projects on public lands.

-The *Baldwin County Water Festival* (conducted by Mike Shelton Watershed/CTP Coordinator.) reached 1,000 4th graders.

-The “*Watershed Wagon*” is a new program developed by our Watershed/CTP Coordinator, Mike Shelton. The “Watershed Wagon” is a trailer filled with everything needed to conduct educational watershed programs at special events or other on the road venues.

Special Events

Special events include a River Clean-up each May, a Coastal Clean-up each September, and a booth at Earth Day and the Alabama Coastal Bird Festival

Community Education

The Weeks Bay NERR Interpretive Center is open 7 days a week and has approximately **25,000** visitors each year. Reserve staff members conduct numerous environmental education programs for various adult groups aboard our pontoon boat.

Outcome Summary Weeks Bay Reserve staff members strive to provide quality estuarine education programs. By partnering with other agencies and organizations in the area we have been able to provide programs for a wider range of audiences.

Wells NERR

Suzanne Kahn Eder, Education Coordinator, Suzanne@wellsnerr.org

School Programs Our popular field-based Exploring Estuaries program for grades 3-5 brought eleven schools with a total of 704 students to the Reserve. The Water Quality Monitoring and Microscopic Drifters programs for grades 6-12 attracted one school each last spring with a total of 70 students. Over 100 students participated in guided custom programs, while self-guided school groups brought 250 people to the Reserve. Through a new partnership with the Wells School District, we offered a spring afterschool program for middle school students. This Reserve Rangers program had a total of twenty 7th and 8th grade students attend five weekly environmental programs.

Public Programs The Reserve offered a myriad of public programs, including a wildlife tracking workshop, seasonal tree walks, a vernal pool program, woodcock watch, beach profiling, geocaching 101, Perseids meteor program, harvest moon hike, owl prowling, and more. We also started a summer preschool Explorers program. Two of our partner organizations, York County Audubon Society and the Center for Wildlife, also offered a range of programs onsite. Thus far in 2009, our public programs have had 956 people in attendance.

Camps The Reserve offered both February vacation week and summer day camps. Just For Kids is geared for children ages 6-9 and Junior Researchers is for ages 9-12. Our two days of February day camps attracted 39 children, whereas our summer camps had 180 children in attendance.

Events Our popular Punkinfiddle/National Estuaries Day Celebration attracted an estimated 2000 people this year. The free Earth Day celebration had 400 people and Winter Family Fun Day attracted just over 100 people. The annual Bird Seed Sale will be held in November.

Teacher Trainings The Reserve hosted several trainings this year. Three Project Learning Tree workshops were held onsite for a total of 47 teachers. A spring Project Wild workshop was full with 20 participants. We also hosted 28 middle school teachers onsite for NOAA's Earth as a System is Essential (EaSiE) weeklong summer institute.

Trail Signs, Programs & Exhibits New tree identification signs now grace the Reserve's seven miles of trails. In addition, we have a brand new kiosk and land protection sign onsite. Education staff completed one of three Discovery Program booklets/backpacks, *Water Wonders*, designed for use by families on the trails. The two others, *Habitat Hike* and *Time Travel*, will be completed by Earth Day, 2010.

Outcome Summary We are addressing our mission of providing high quality, science-based programs that promote stewardship of the Gulf of Maine watershed and coastal environments, while also optimizing the educational use of the site and increasing public awareness of its cultural and ecological significance.

Estuarine Reserves Division 2009 National Education Report

Atziri Ibanez, National Education Coordinator – Atziri.Ibanez@noaa.gov

Amy Clark, Program Specialist – Amy.Clark@noaa.gov

Program Highlights during Fiscal Year 2009. Over this past year, ERD has been busy working to complete various NERRS projects. In addition, we have been involved in shaping NOAA's vision and plans for education, and future plans for evaluation. Specific accomplishments include:

Completed EstuaryLive and Video Gallery. ERD, together with the EstuaryLive Workgroup and Marine Grafics, Inc. worked hard on coordinating the EstuaryLive broadcast and in developing a video collection made up of clips on specific topics pulled from 10 years of EstuaryLive broadcasts. The video clips will be posted by the end of 2009, and captioning will be added as well.

Launched Curriculum Module on Monitoring Estuarine Water Quality – Grades 5-8. Three curriculum modules have been developed and launched as part of the NOAA Data Education project. The third module focuses on how changes in water quality conditions have an impact on organisms living in estuaries, by using an interface that relies on the NERRS/SWMP data. www.dataintheclassroom.org

Improved nerrs.noaa.gov site & updated education content on site. ERD contributed to re-designing and updating the content on what will be an improved nerrs.noaa.gov site.

Launched the First Online Educational Game Ever Produced by NOAA. Together with the National Ocean Service, ERD launched an online Estuaries Flash Game which consists of four challenges interspersed with animated sequences that tell a story. Student tackle trash clean-up recycling, remove obstructions in waterways, replant the habitat to bring back food webs, and battle pollution monsters to restore an estuary. <http://games.noaa.gov>

Designed a New SWMP Data Analysis Exploration Tool. ERD, together with the SWMP Interpretation Workgroup, and Tellus Applied Sciences worked to develop a data exploration application using SWMP data for educators & students. This application is 90% done and will be completed by the end of 2009.

Advanced The Field in Estuary & Coastal Literacy. This year ERD played an important role in ensuring that estuaries and coastal issues were incorporated in NAAEE Conference by coordinating the Marine and Coastal strand. In addition, NERRS was invited to present to the National Academies of Sciences, as part of an overall evaluation done on NOAA education programs.

Bolstered NERRS presence & participation in key NOAA education discussions. ERD has taken an active role in shaping NOAA's Education Strategy Plan & Implementation Plan. Atziri is the Chair of the Evaluation Workgroup which will implement a strategy to evaluate all NOAA education programs.

Outcome Summary: Educators' and students' access to & understanding of estuaries were enhanced with EstuaryLive, the launch of a water quality module and an online estuaries game. 67% of teachers rated their experience using the NODE Demonstration Project modules as excellent. 11,409 individuals participated in EstuaryLive 2009 via the Internet. Students showed a statistically significant increase in their understanding of what they can do to maintain or improve the health of the estuary. (pre=52%, post=72%). New partnerships have been forged and ERD is invited to discussions that aim to improve education across NOAA.